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THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS *US60/562,868*



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This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

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ENCLOSED APPLICATION PARTS (check all that apply)					
<input checked="" type="checkbox"/> Specification Number of Pages 8		<input type="checkbox"/> CD(s), Number _____			
<input checked="" type="checkbox"/> Drawing(s) Number of Sheets 1		<input type="checkbox"/> Other (specify) _____			
<input type="checkbox"/> Application Data Sheet. See 37 CFR 1.76					
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT					
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.		FILING FEE Amount (\$)			
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The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.					
<input checked="" type="checkbox"/> No.					
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Respectfully submitted,

[Page 1 of 2]

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(if appropriate)

Docket Number: 0003-0003

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Docket Number 0003-0003

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Number 1 of 1

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## **SYSTEM AND METHOD FOR CLEANING COFFEE GRINDING MACHINE**

### **Field of the Invention:**

This invention relates generally to cleaning coffee grinders, and more particularly to a method, formulation, and procedure for cleaning and removing accumulated particle and oil residue in home or commercial coffee grinders.

### **Background:**

The optimal preparation of coffee is dependent on bean quality, roast execution, grind consistency, product freshness, and equipment cleanliness. After harvest and drying, whole coffee beans are roasted. Roasting serves to draw out the beans' essential oils in preparation for the brewing process. After roasting, and just prior to brewing, the beans are ground. Grinding increases the coffee bean surface area available for the extraction of coffee oils during brewing.

It is generally agreed that the optimal taste profile of coffee is achieved when the time between grinding and brewing is the shortest possible. It is also accepted that the taste of the highest quality coffee beans can be easily contaminated. The most common cause of this contamination is the commingling of fresh beans with rancid coffee oil and particulate residue left behind from previous preparations.

In an effort to minimize the time between grinding and brewing coffee, there are coffee bean grinders in place in the vast majority of supermarkets, grocery stores, restaurants, and coffee retailers around the world. Many households also own grinding appliances to further reduce the time between grinding and brewing.

The coffee industry follows a rigorous procedure of cleaning coffee brewing equipment to insure the removal of coffee oil residue from servers, faucets, urns, decanters, filter baskets, screens, porta-filters, and even whole bean containers. These cleaning

procedures are based on an effort to reduce the chance of contamination of fresh beans or brewed coffee with rancid residue and old bean particles. While procedures and products exist for cleaning brewing equipment of all varieties there is no standard method, procedure, or product for removal of coffee oil residue or particles from grinding equipment.

Since grinding is the first step in the brewing procedure, it is also the first opportunity for accumulated coffee oil residue (which has possibly turned rancid) to contaminate freshly ground beans. Each time a bean is ground, there is an opportunity for it to contact the grinder burrs or blades. These components may often be coated with coffee residue.

Aside from the possible contamination of freshly ground beans by the oily residue of previously ground beans, there is also a grinder cleaning issue surrounding "flavored coffees." Flavored coffees are roasted coffee beans that have been commercially infused with essential oils and flavorings. This is done to enhance their taste and aroma. Some popular flavored coffees include hazelnut, amaretto, vanilla, and raspberry.

The brewing preparation methods for flavored coffee are identical to those of non-flavored coffees. This includes the need to grind the beans before extraction of essential oils from the coffee -- both natural and added oils. While it has already been established that the oils of natural coffee beans accumulate in grinders, it should be noted that the added oils of flavored coffees can also accumulate in grinders.

One issue that arises with the accumulation of flavorings in grinders is co-mingling when residue from one flavor variety is ground after another in the same grinder. Most retailers have only one grinder for all flavored coffees and a second for non-flavored coffees. While this removes the chance of flavoring un-flavored beans, it does not eliminate cross contamination of two different flavor types.

In addition to the problems of cross-contaminated flavorings, the added oils in flavored coffee have a tendency to "gum up" grinder burrs and blades. The flavoring additives create a sticky substrate that can affect grinder effectiveness. Unfortunately, regardless of the possibly substantial mechanical effect of oily accumulation on grinders, the accumulated oils are certain to infuse and contaminate all subsequent batches of coffee.

At present, there are only two known techniques for purging of oil and particle accumulation in coffee grinding equipment. Due to the fact that most commercial and home grinding burrs are made of either steel or ceramic and held in tight spaces near electrical motors, water or other liquids cannot be introduced into the grinding chamber. Adding liquid could either rust the steel burrs or damage electrical circuitry. As a result, both current procedures have major challenges.

Most grinder manufacturers and sellers will recommend periodic disassembly of grinders and brushing of burr teeth and wheels with a soft bristle. While effective at removing particle residue, this technique is both time consuming and complicated. In addition, the process of brushing does nothing to absorb or remove oil residue.

A second much less frequently discussed grinder cleaning technique is the delivery of common, uncooked rice into the grinding chamber. While this technique does provide the possibility of a quick and easy approach to trying to purge the burrs of coffee residue, the starchy nature of rice, the inaccurate portioning guidelines, and the gummy residue of rice does not provide a reliable solution.

### **Drawings:**

The features of the present invention are set forth with particularity in the appended claims. The invention itself, together with further features and attendant advantages, will become apparent from consideration of the following detailed description, taken in conjunction with the accompanying drawings. An exemplary embodiment of the

invention is now described, by way of example only, with reference to the accompanying drawings in which:

FIG. 1 is a side view of a coffee grinding machine into which a cleaner is being poured in accordance with the present invention;

FIG. 2 is an isometric view of a soiled burr located inside the coffee grinding machine of FIG. 1; and

FIG. 3 is an isometric view of the soiled burr of FIG. 2 after being cleaned in accordance with the present invention.

**Description:**

Recognizing the opportunity to provide a technique, method, and product for cleaning grinders, there is provided a range of human safe products that can be easily introduced into the grinding chamber and cycled through the equipment. In particular, portioning of an appropriate amount of particles in a carefully defined formula mix for grinding through a machine is provided. Some of the particles include, but are not limited to, corn cobs, walnut shells, pecan shells, nuts, rice, dried corn kernels, barley, wheat, and other grain, fiber, legume, nut, bark, and shell products in varying shapes and sizes. One key foundation of the products being tested is a desire to avoid contamination of coffee taste and food safety. For this reason, mostly organic products have been tested to date. However, the inorganic materials also may be equally effective.

The portion packages or bulk pails of a mixture of some of the above noted ingredients in carefully managed formulation are provided. The procedure calls for the following steps:

1. Operator purges coffee grinder of all whole bean coffee and ground coffee residue by running grinder until empty;



2. Recommended dose of grinder cleaning materials is inserted into coffee bean hopper and grinder is run as if grinding coffee;
3. A series of on and off rest periods allows the grinder to adjust to the new substance;
4. A series of changes of grinding fineness insures the movement of the cleaning substance in and out of the grinding chamber;
5. All cleaning substance are ground through grinding equipment and purged as was done with coffee;
6. A recommended and defined amount of fresh coffee is placed in the bean hopper and also sent through the grinder following the procedures in 3, 4, 5 above;
7. Once the above procedure is completed, fresh whole bean coffee is returned to the hopper and coffee preparation resumes; and
8. The cleaning procedure is repeated as necessary.

The types of grinding equipment on which the above mentioned formulation, method, and procedure can be performed on include, but are not limited to: burr, conical burr, blade, free-standing, integrated and superautomatic espresso integrated grinders.

A particular advantage of the present invention is that by delivering a secondary product into enclosed grinding chambers to remove oil and particulate residue, the need for more regular disassembly of grinder mechanisms for cleaning is eliminated. In addition, the method offers the first means of cleaning several types of grinding mechanisms that are currently fully enclosed (such as those in vending and superautomatic espresso machines).

As described above, many different organic or inorganic materials may be used for cleaning the grinding equipment. By way of example only, the formulation may include more or less than 50% corn cob of varying size particles and a balance of 1-2 other ingredients. The formulation may vary based on the type of machine and particular cleaning requirements of the particular machine.

Based on the fact that the average amount of coffee used to brew the standard pot is 70g to 100g, between 100g and 400g of product may be required to clean the machine. The process may have to be repeated several times to ensure that the grinder is adequately cleaned.

As shown in FIG. 1, the cleaning material 10 is poured from a package 12 into the coffee grinding machine 14, just as coffee beans would be poured in for grinding in normal operation. As the materials 10 move through the machine 14, they create contact with the grinding burrs 16, 18.

FIG. 2 shows the soiled burr 16 prior to the cleaning material formulation 10 being deposited into the grinding machine 14. As the burrs 16, 18 grind up the cleaning materials 10, the coarseness of the cleaning materials creates a friction on the burrs that causes the soil 20 from the burrs to be rubbed or knocked off. This results in a significantly cleaner burr, as shown in FIG. 3. Depending on the interval between cleanings, the type of coffee being ground and other factors, the cleaning step is repeated until the burrs 16, 18 are adequately cleaned.

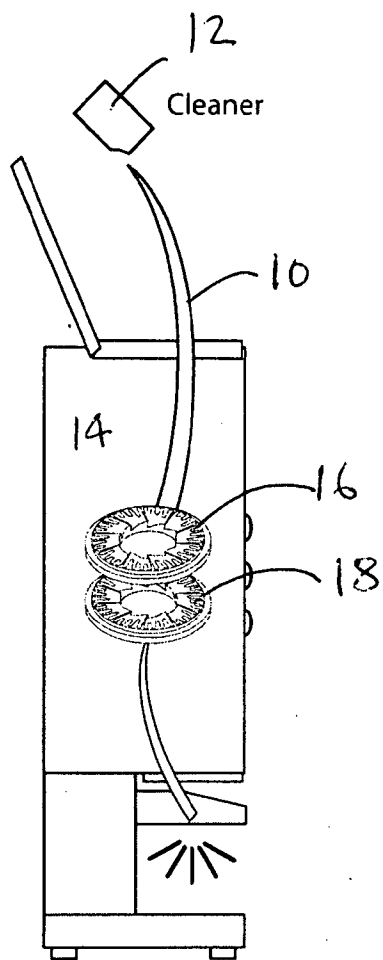
While the invention has been described in conjunction with a specific embodiment thereof, it is evident that many alterations, modifications and variations will be apparent to those skilled in the art in light of the foregoing description. Thus, it should be understood that the invention is not limited by the foregoing description, but embraces all such alterations, modifications and variations in accordance with the spirit and scope of the appended claims.

**Claims:**

What is claimed is:

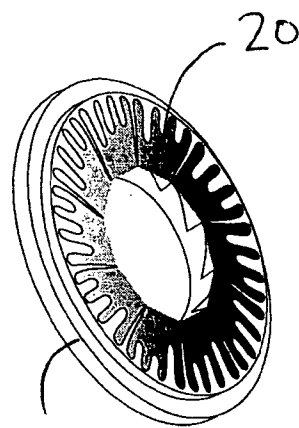
1. A method for cleaning a coffee grinder comprising:
  - apportioning a predetermined amount of coarse material;
  - inserting said coarse material into the coffee grinder;
  - grinding said coarse material using the coffee grinder; and
  - purging said coarse material from the coffee grinder.
2. The cleaning method of claim 1 wherein the coarse material comprises one or more of the following organic materials:
  - (a) legumes;
  - (b) corn husks;
  - (c) walnut shells;
  - (d) pecan shells;
  - (e) nuts;
  - (f) rice;
  - (g) dried corn kernels;
  - (h) barley;
  - (i) wheat;
  - (j) grain;
  - (k) fiber;
  - (l) legume;
  - (m) nut;
  - (n) bark; and
  - (o) shell
3. The cleaning method of claim 2 wherein the organic material comprises substantially 50% corn husks.

4. The cleaning method of claim 3 wherein the organic material comprises at least 50% corn husks.



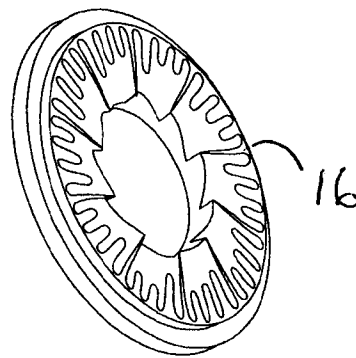
Grinder Side View  
Method of Delivery

FIG. 1



16 Soiled Burr

FIG. 2



Clean Burr

FIG. 3